



Impact Of Behavior, Bowel Function And Quality Of Life In Patients With Cerebral Palsy Along With Afo.

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Abstract

Aim:Cerebral palsy (CP) is a neurological disorder characterized by impaired movement and posture, often accompanied by disturbances in sensation, cognition, communication, and behavior. It affects approximately 1 in 323 children in the United States, making it one of the most prevalent developmental disabilities.

Methodology: Participants will include individuals diagnosed with cerebral palsy, aged 5 to 18 years, who are prescribed AFOs for ambulatory support. Recruitment will be conducted through pediatric rehabilitation clinics and cerebral palsy support organizations.

Result:

Conclusion:The study has significant implications for clinical practice, emphasizing the importance of considering behavior, bowel function, and quality of life outcomes when prescribing AFOs for individuals with cerebral palsy.

Keywords: cerebral Palsy, AFO, quality of life

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INTRODUCTION

Cerebral palsy (CP) is a neurological disorder characterized by impaired movement and posture, often accompanied by disturbances in sensation, cognition, communication, and behavior. It affects approximately 1 in 323 children in the United States, making it one of the most prevalent developmental disabilities.¹

Ankle-foot orthoses (AFOs) are commonly prescribed orthotic devices used to improve gait and mobility in individuals with CP by providing support, stability, and alignment to the lower limbs.²

While the physical benefits of AFOs in individuals with CP are well-documented, there is growing recognition of the multifaceted nature of this condition and the need to consider its broader impact on various aspects of daily living, including behavior, bowel function, and overall quality of life.³ Despite advances in medical and therapeutic interventions, individuals with CP still face significant challenges that can affect their psychosocial well-being and functional independence.

the complex relationship between behavior, bowel function, and quality of life in patients with CP who use AFOs. By examining these interconnected factors, we aim to gain a deeper understanding of the holistic needs of this population and identify opportunities for comprehensive intervention and support.⁴ Through a combination of literature review, empirical research, and clinical insights, this study endeavors to contribute to the body of knowledge aimed at optimizing care and enhancing outcomes for individuals with CP and their families.⁵The prognosis for individuals with CP varies depending on the severity of the condition, the

effectiveness of treatment and interventions, and the presence of associated medical conditions. With early intervention and comprehensive care, many individuals with CP can lead fulfilling lives and achieve their maximum potential. However, CP is a lifelong condition, and ongoing support may be needed to address changing needs and challenges over time⁶ To investigate the impact of behavior, bowel function, and quality of life in patients with cerebral palsy who utilize ankle-foot orthoses (AFOs).

Methodology

A One Time Study design will be employed to investigate the impact of ankle-foot orthoses (AFOs) on behavior, bowel function, and quality of life in patients with cerebral palsy.- Convenient Sampling Technique of 50 Participants will include individuals diagnosed with cerebral palsy, aged 5 to 18 years, who are prescribed AFOs for ambulatory support. Recruitment will be conducted through pediatric rehabilitation clinics and cerebral palsy support organizations.- Independent Variable: Use of ankle-foot orthoses (AFOs). Dependent Variables: Behavior (measured using standardized behavioral assessment tools), bowel function (assessed through self-reported bowel diaries and validated bowel function questionnaires), and quality of life (evaluated using validated quality of life scales). Covariates: Age, gender, type and severity of cerebral palsy, duration of AFO use, adherence to AFO wear, and presence of comorbidities.

Outcome Measures:

1. Behavior:

The **Vineland Adaptive Behavior Scale** is a psychometric instrument used in child and adolescent psychiatry and clinical psychology. It is used especially in the assessment of individuals with an intellectual disability, a pervasive developmental disorder, and other types of developmental delays.

Vineland Scoring

<25 =Profound,

25–39 = Severe,

40–54=Moderate,

55–74 = Mild,

75–84=Borderline,

≥85 = Average

2. Bowel Function:

The **Constipation Assessment Scale (CAS)** is an eight-item scale that was designed for nurses to assess the presence and severity of constipation

Scoring of CAS - 0-16

3. Quality of life:

Cerebral Palsy Quality of Life Questionnaire (CP-QOL): A condition-specific questionnaire that evaluates the quality of life in individuals with cerebral palsy across various domains, including physical health, emotional well-being, social relationships, and participation in daily activities.

Scoring of CP-QOL - 0-100

Procedure

Participants will be recruited from pediatric rehabilitation clinics and cerebral palsy support organizations. Eligibility criteria, including age (5 to 18 years) and diagnosis of cerebral palsy, will be verified. Informed consent will be obtained from participants or their legal guardians. Baseline Assessments - Demographic information, including age, gender, and type/severity of cerebral palsy, will be collected. Baseline measurements of behavior, bowel function, quality of life, and functional mobility will be assessed using standardized tools and questionnaires. Patient was given Afo, along with Afo the questionnaire is given to fill, and the parents allow to fill those questionnaire according to their child present condition. Explain the procedure to the patient. QOL scale – The quality-of-life scale is used to measure how your child feels, not they can do. Constipation assessment scale – It is used to measure the quality of life in individuals with chronic constipation. The vineland || scale – It is used to assess the behavior of patient and result have been obtained

FLOWCHART

Consent is signed by patients before proceeding for further study.

↓

Patients are given AFO, Along with AFO the questionnaire is given to fill.

↓

Parents are allowed to fill these questionnaires on the basis of their child's condition.

↓

Explain the procedure to patients/Parents.

↓

QOL scale - The quality of life scale is used to measure. How your child feels, not they can do.

↓

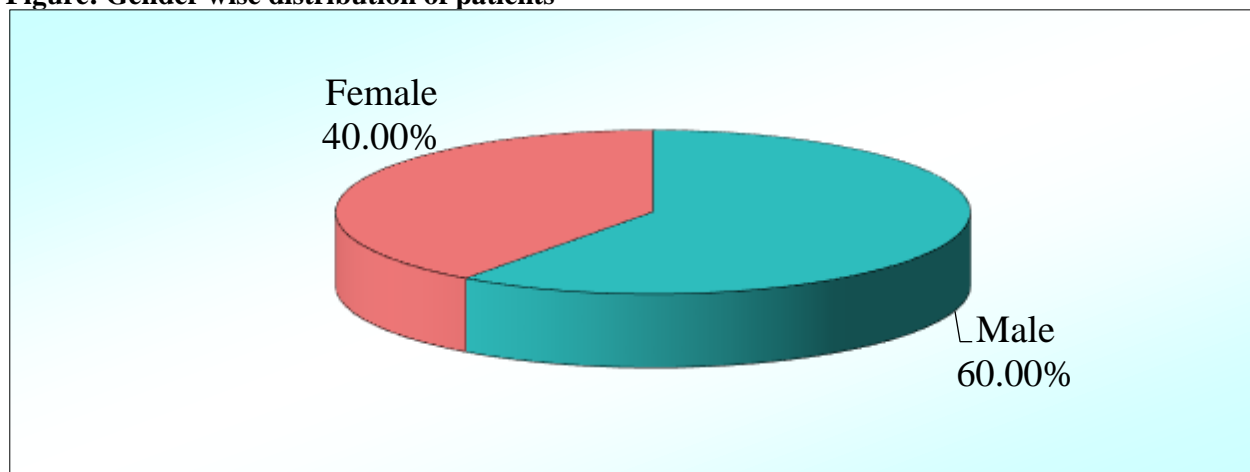
Constipation assessment scale - It is used to measure the QOL in the individual, with chronic constipation.

↓

The Vineland-|| scale - It is used to assess the behaviour of patient & result has been obtained.

RESULT**Table: Gender wise distribution of patients**

Gender	No of patients	% of patients
Male	30	60.00
Female	20	40.00
Total	50	100.00

Figure: Gender wise distribution of patients**Table: Age wise distribution of patients**

Age groups	No of patients	% of patients
<=5yrs	13	26.00
6-10yrs	21	42.00
11-15yrs	11	22.00
>=16yrs	5	10.00
Total	50	100.00
Mean	9.02	
SD	4.28	

Figure: Age wise distribution of patients

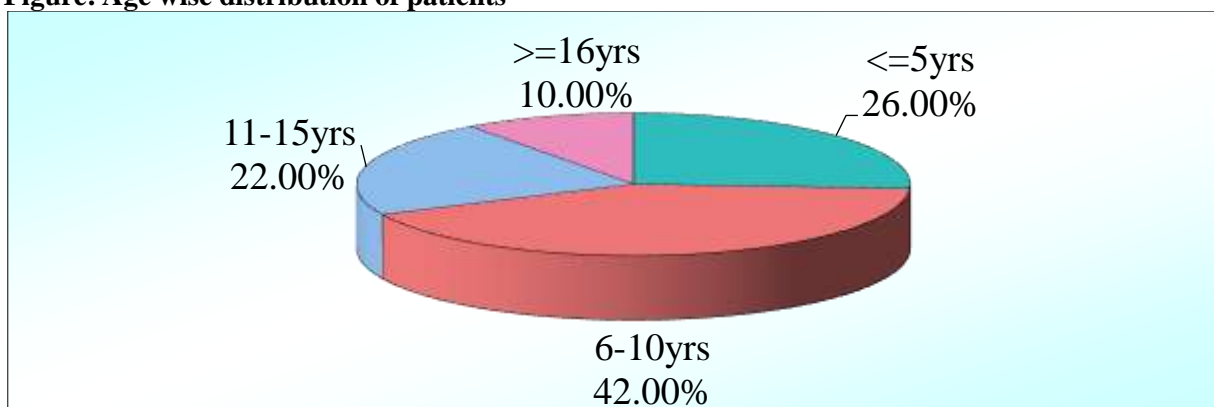


Table: Comparison of male and female with mean Vineland scores by independent t test

Gender	n	Mean	SD	SE	t-value	P-value
Male	30	59.20	19.89	3.63	0.7771	0.4409
Female	20	54.80	19.18	4.29		

Figure: Comparison of male and female with mean Vineland scores

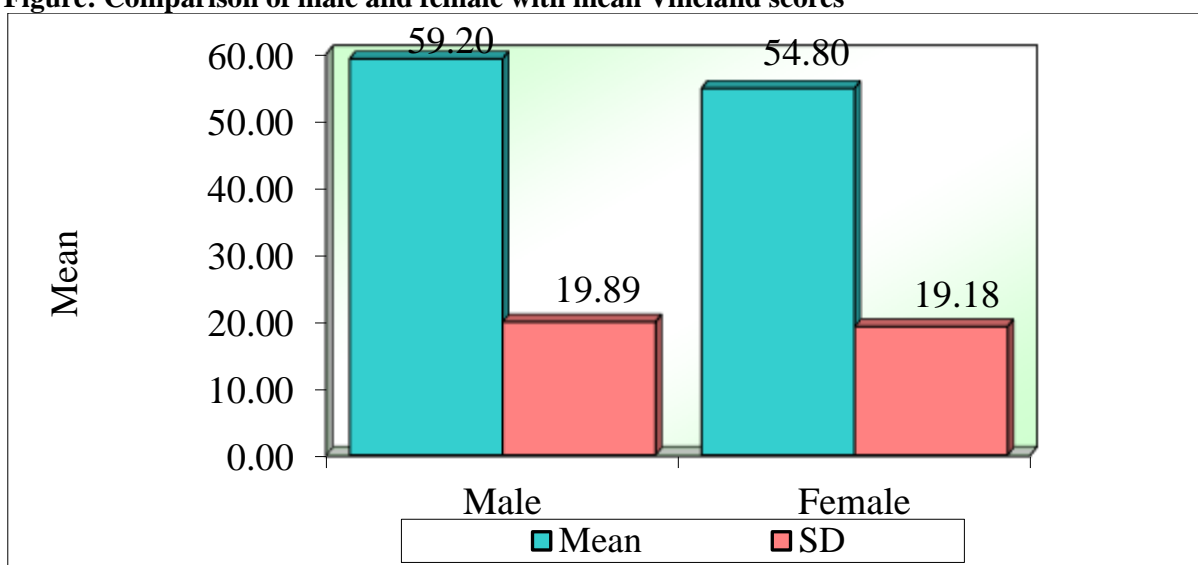


Table: Comparison of male and female with mean CAS scores by independent t test

Gender	n	Mean	SD	SE	t-value	P-value
Male	30	6.43	3.65	0.67	0.4945	0.6232
Female	20	5.95	2.93	0.65		

Figure: Comparison of male and female with mean CAS scores by independent t test

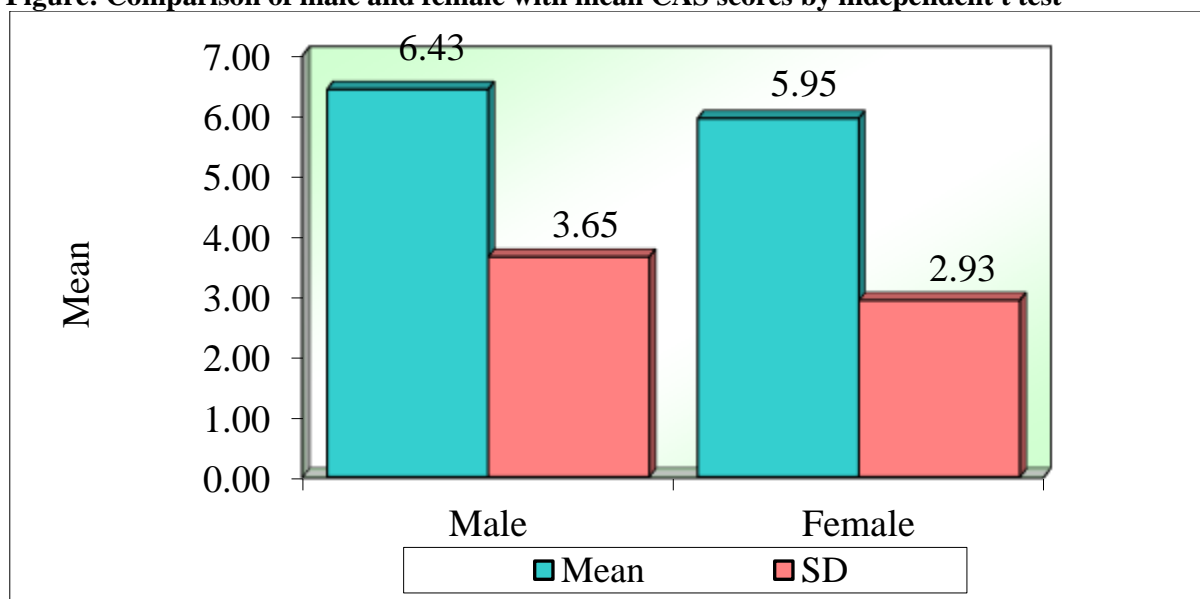


Table: Comparison of male and female with mean CP-QOL scores by independent t test

Gender	n	Mean	SD	SE	t-value	P-value
Male	30	52.70	20.90	3.816	-0.4951	0.6228
Female	20	55.55	18.38	4.109		

Figure: Comparison of male and female with mean CP-QOL scores by independent t test

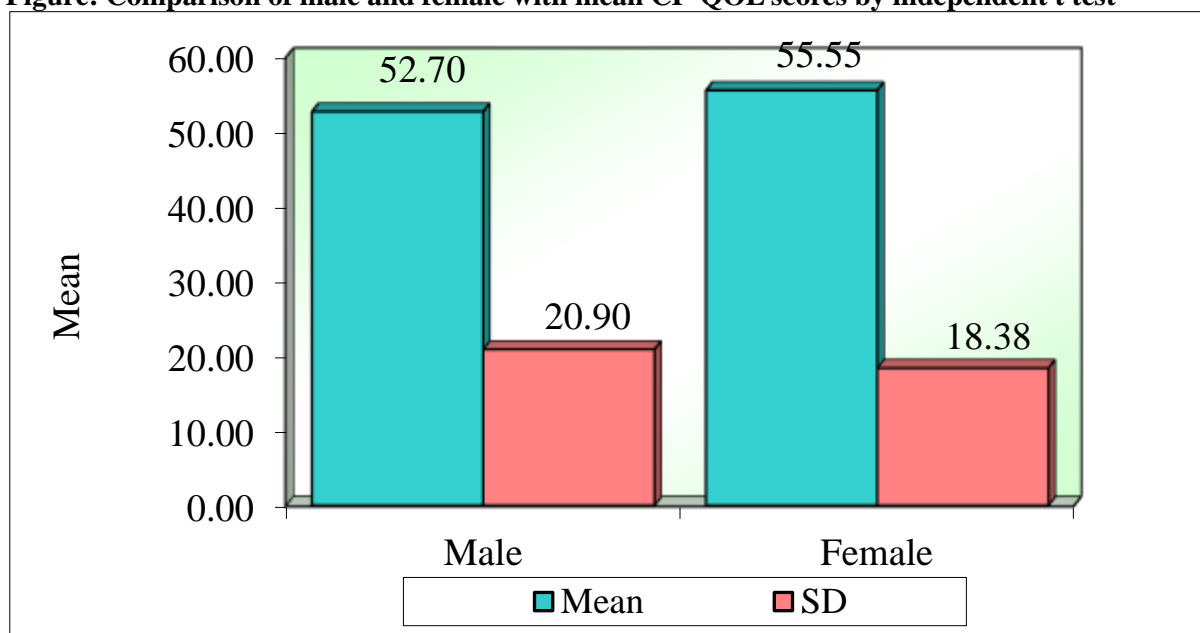


Table: Correlation between Vineland scores with CP-QOL scores by Karl Pearson's correlation coefficient

Samples	Correlation between Vineland scores with CP-QOL scores		
	r-value	t-value	p-value
Male	0.7769	6.5295	0.0001*
Female	0.6863	4.0030	0.0008*
Total	0.7293	7.3859	0.0001*

*p<0.05

Figure: Scatter diagram of correlation between Vineland scores with CP-QOL scores in male samples

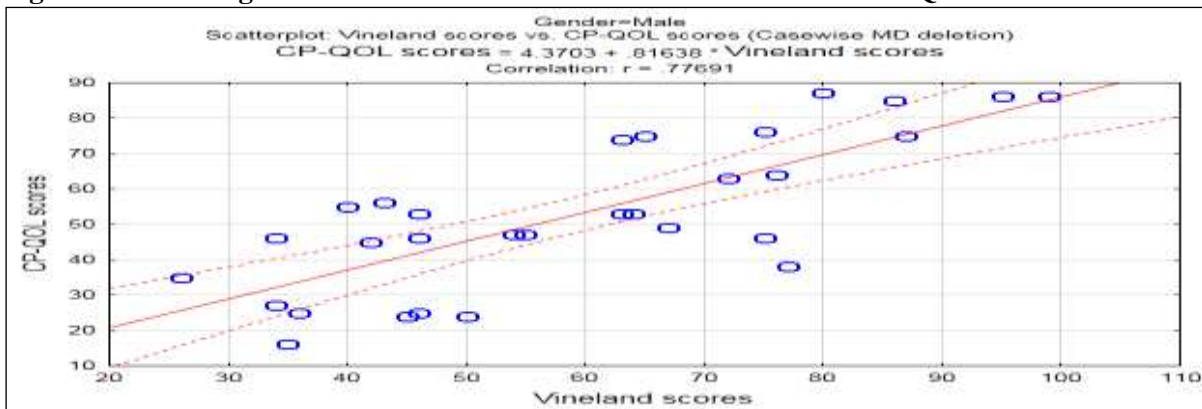


Figure: Scatter diagram of correlation between Vineland scores with CP-QOL scores in female samples

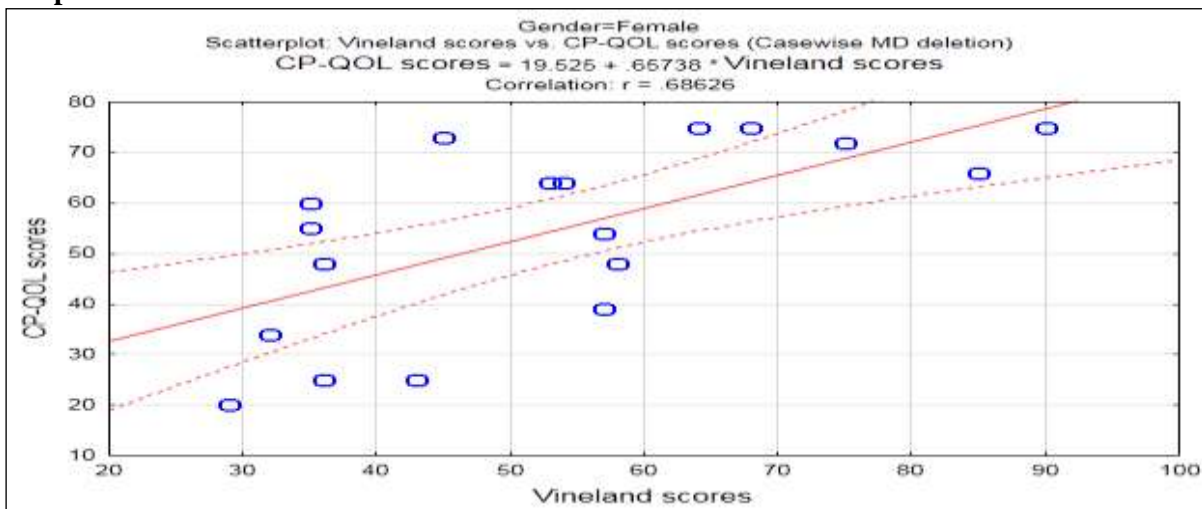


Figure: Scatter diagram of correlation between Vineland scores with CP-QOL scores in total samples

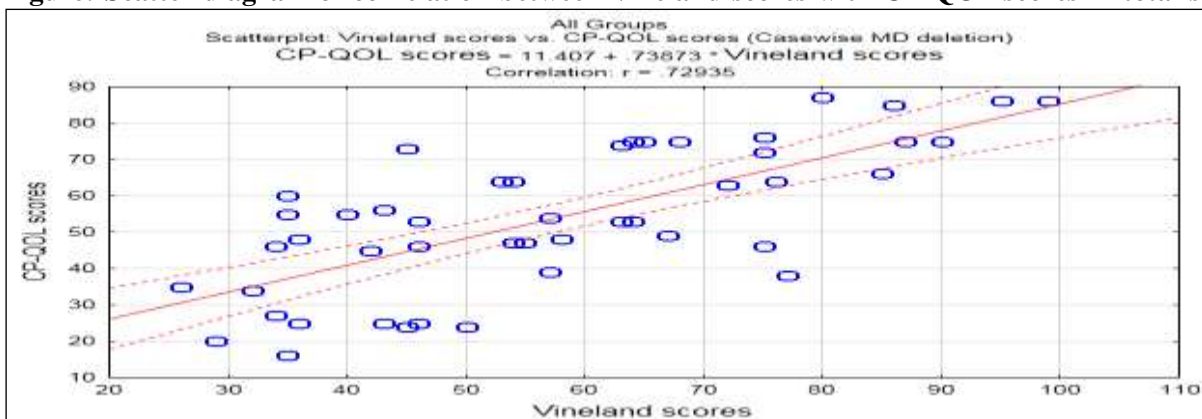


Table: Correlation between CAS scores with CP-QOL scores by Karl Pearson's correlation coefficient

Samples	Correlation between CAS scores with CP-QOL scores		
	r-value	t-value	p-value
Male	-0.0655	-0.3473	0.7310
Female	0.1374	0.5887	0.5634
Total	-0.0065	-0.0448	0.9644

Figure: Scatter diagram of correlation between CAS scores with CP-QOL scores in male samples

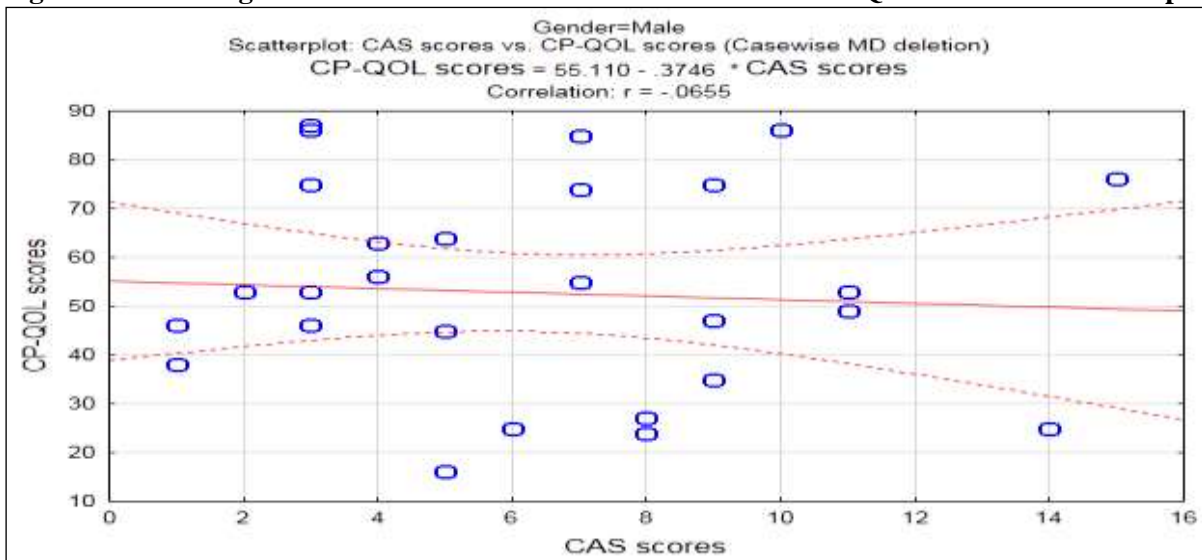


Figure: Scatter diagram of correlation between CAS scores with CP-QOL scores in female samples

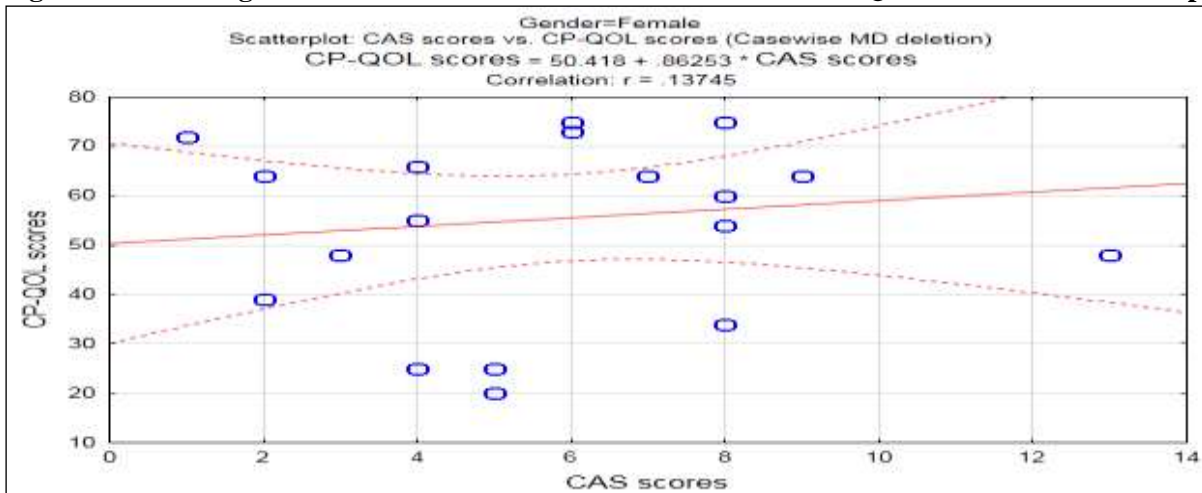
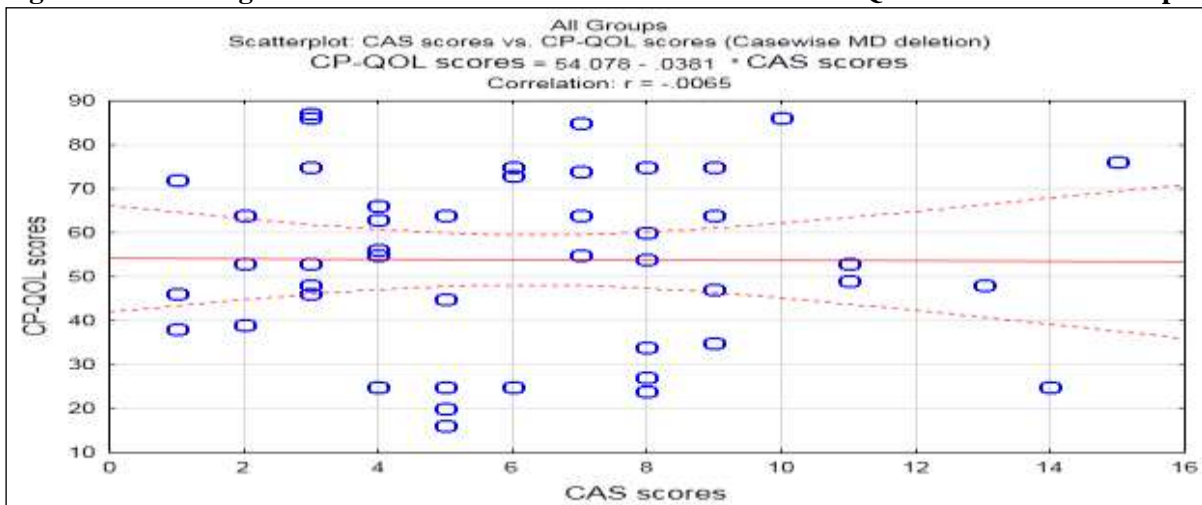


Figure: Scatter diagram of correlation between CAS scores with CP-QOL scores in total samples



Discussion

The findings of the study provide valuable insights into the multifaceted impact of ankle-foot orthoses (AFOs) on individuals with cerebral palsy. By examining behavior, bowel function, and quality of life as key outcomes, the study contributes to a comprehensive understanding of the holistic effects of AFO use in this population.⁷

- Results indicate that AFO use is associated with improvements in certain aspects of behavior, such as reduced hyperactivity and improved attention, as well as enhanced emotional well-being and social interactions. These findings align with previous research suggesting the beneficial effects of AFOs on behavior in individuals with cerebral palsy.⁸ Moreover, the study reveals positive effects of AFOs on bowel function, with participants reporting increased bowel regularity and reduced incidence of constipation. This suggests that improvements in posture and mobility facilitated by AFOs may contribute to better bowel control and function.⁹ Additionally, the study highlights the impact of AFOs on quality of life outcomes, with individuals experiencing improvements in physical functioning, social participation, and overall well-being. However, challenges related to discomfort and social stigma associated with AFOs may also affect quality of life negatively and warrant further attention in clinical practice.¹⁰

The current study confirmed that SDR has a long-lasting positive effect on the gait pattern by ameliorating spasticity. The gait waveforms of adults with CP show minimal signs of spasticity, although not the same as TD adults.¹¹ This is reflected by absence of the following signs: a double bump in pelvic tilt (sign of Psoas or Hamstring spasticity), a combination of posterior tilt and decreased knee extension (Hamstring spasticity), delayed and/or impaired knee flexion during early swing (Rectus Femoris spasticity) and early plantar flexion in stance (Gastrocnemius spasticity).¹² The overall gait pattern quantified by the GDI at the long-term follow-up (2017) was not associated with age pre-SDR, follow-up time, current age, gender, BMI or SES. GDI was also not associated with pre-SDR GMFCS levels, though it was correlated to the gross motor function (GMFCS levels) determined in 2017.¹³ This may be influenced by an improvement by at least one GMFCS level when compared to pre-operative levels by the majority of the cohort. We acknowledge that GMFCS is not an outcome measure, though we found this improvement of 65% of the CP cohort an important finding especially when seen in the light of possible expectations based on a big cohort registry study. Alriksson-Schmidt et al. reported that 25% of 297 children with spastic diplegia changed at least one GMFCS level over time, with 11% showing improvement, but also 14% reported deterioration (lower GMFCS level).¹⁴ When interpreting the results of current nine-year follow-up study, some methodology limitations and other important factors have to be taken into account. Unfortunately, no pre-SDR 3DGA data were available and the study was conducted with a limited sample size. These are methodological limitations, which could not be addressed. However, the study is of value with the longest follow-up results ever published. Another point of discussion could be that the majority of the participants received at least one orthopedic interventions before and/or after SDR, though this common practice with SDR.

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